

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

RS-INT
RESEARCH PROGRAM ✓
Working Plans

RS-INT
REGENERATION
Planting
(Stock-Site-Aspect)

WORK PLAN

STOCK-SITE-ASPECT STUDY

By

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Intermountain Forest & Range Experiment Station

January 6, 1958

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WORK PLAN

STOCK-SITE-ASPECT STUDY

Object: (a) To test further the feasibility of planting ponderosa pine using powered diggers, that is a chain saw and a one-man "Little Beaver," each with a soil auger attachment.

(b) To compare two kinds of stock, namely, 2-0 (Town Creek "special") planting stock and 1-0 seedlings in containers.

(c) To test three kinds of ground preparation, spot scalping, contour strips, and plowed furrows.

(d) To test the effect of two aspects, northeast and southwest, on the survival of the different kinds of planted stock.

Location: The eastern part of the Headquarters site of the Boise Basin Experimental Forest Headquarters area, east of the Centerville road.

Site: The area to be planted supports scattered bitterbrush, choke-cherry, Alder, and a variety of herbaceous plants of which cheatgrass and tarweed are most numerous. There are some perennial grasses. The site is situated towards the south end of a north-south ridge so that southwest, south, and northeast aspects are prominent.

Site preparation: The 6-foot wide contour strips were made in June 1957 with a TD-9 tractor guided by staked contours. They were spaced so that there was ample room between the overspill of free soil from one strip and the start of the cut of the next. An attempt was made to tilt

these strips towards the bank from which they were cut to ameliorate the severity of the micro-climate. The furrowed strips were made with an Oliver tractor and Talladega plow in the fall of 1957, between the contour strips. These plowed furrows resulted in a vee-shaped strip some 8 to 12 inches deep and 20 inches wide from which vegetation is removed and a means created so that precipitation will be concentrated and root penetration of planted seedlings will be deeper than if planted on the soil surface. The third method will consist of hand scalping with mattocks or grub hoes on squares 2 feet on each side and approximately 6 feet apart.

Arrangement of planting stock: Four types of seedlings will be planted on each of the two blocks on each of the two sites. These four types are:

- (1) 2-0 stock planted in hole dug by shovel
- (2) 2-0 stock planted in auger holes
- (3) 12" tubes planted in auger holes
- (4) 16" tubes planted in auger holes.

These seedlings will be planted in a mixed arrangement, rather than definitive plots, and will be selected at random and the resulting pattern maintained throughout.

A total of 40 seedlings of a particular type will be planted on each site, on each block on each aspect. This means 120 seedlings of each type on each block, or 480 seedlings of all types on each block. On one aspect there are two blocks so there will be 240 seedlings of each of four types or 960 seedlings in all. On the two aspects there will thus be a grand total of 1,920 seedlings.

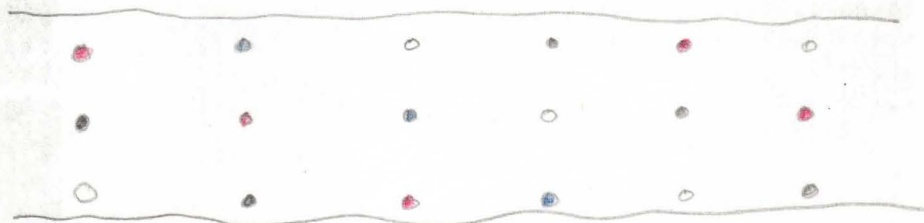
The following tabulation shows the number of seedlings in each type:

2-0 shovel planted	480
2-0 auger planted	480
12" tubes	480
16" tubes	<u>480</u>
Total	1,920

Before planting begins, the area will be staked to show the location of each seedling. Seedling types will be designated by painted stakes as follows:

No color	-	2-0 shovel planted
Yellow	-	2-0 auger planted
Blue	-	12" tubes
Red	-	16" tubes

Whereas a spacing of 6 to 7 feet will be maintained in the scalped spots and plowed furrows, a closer spacing will be necessary on the contour strips. The necessary number of seedlings will be planted in rows of three, 6 to 7 feet apart and the plants $2\frac{1}{2}$ feet apart in each row. In order to distribute the seedlings more systematically on the contour strip site, the pattern will be diagonal across the strip. In this way the effect of competition between the kinds of seedlings will be lessened with the close spacing. This arrangement is illustrated below.



Planting stock: The stock to be planted will consist of two kinds. One will be "special" 2-0 seedling stock from the Bend, Oregon nursery, grown from Boise National Forest seed, and transported by special conveyance to the new storage point on Moore's Creek Summit. The other will be 1-0 seedlings grown in both 12-inch and 16-inch waxed cardboard tubes, 2 inches in diameter.

Planting methods: Two methods of planting will be employed, shovel and machine. Both will be the dug hole, rather than the slit type of cavity. The machine dug hole will require one man--or two men if the Homelite machine is used--and, two to four men setting out plants with care being taken that the hole digger not advance to where soil from the holes will dry out in advance of the planting crew. The former method involves digging the hole with a sharp-pointed fire shovel. Both types of holes should be as deep as the longest root of seedlings or about 16 inches and care must be taken to tamp soil around the roots and the containers of each planted seedling.

Planting crew: The planting personnel will be recruited from the Town Creek planting personnel after that project is completed. This will ensure a degree of comparability of this experiment with the Town Creek plantations that is desirable inasmuch as it is hoped to complement the results there rather than duplicate them.

Care of stock: Stock from Bend will be brought to Idaho City by special transport and stored in snow so that the plants will not

break dormancy. No more stock will be taken from the snow at Moore's Creek Summit than can be planted in a day. This will require getting stock each night and storing it at Boise Basin Experimental Forest Headquarters for the following day's planting when it will be trucked to the grading tent and kept there until needed. After bundles are broken the roots will be kept damp by being covered with the shredded wood packing contained in each shipped bundle.

Likewise roots will be kept covered while being carried by the planters in the planter's canvas bags. Container stock in the wooden boxes in which they grew will be transported daily from the BBEP Headquarters and can be distributed in these boxes right on the planting site.

Grading of stock: The 2-0 seedlings will be culled so that no roots are less than 12 inches and preferably longer and that root-top ratios are at least 3, and probably 4, to 1. Stock in containers will not require grading.

Time of planting: Planting will be done after the completion of Town Creek planting probably in early May.

Experimental design: This test will consist of a randomized block design with two blocks on each of the two aspects and with blocks separated by a diagonal line marked by stakes.

Because the same number of seedlings will be planted in each treatment, the data to be analyzed can be by counts of live seedlings. In later examinations tree measurements can be analyzed.


The experiment as described can be analyzed by analysis of variance and will take the following form:

Analysis of variance

Source of variation	D. F.	Sums of squares
Exposure	1	
Replication (both exposures)	2	
Site	2	
Site x exposures	2	
Site x replications (Error #1)	4	
Subtotal	11	
Stock	3	
Stock x exposure	3	
Stock x site	6	
Stock x site x exposure	6	
Stock x replications) Error #2)	18
Stock x site x replications		
Total	47	

Subsequent examinations: The analysis of variance outlined above should be made from survival counts made in October 1958, 1959, and 1962 and the treatment effects evaluated.

Responsibility: Lynch will arrange for the purchase of stakes and the services of the planting crew, and assist in stake layout and supervision of planting crew. Curtis will be responsible for the remainder of the planting layout and subsequent examinations and analyses.


 JAMES D. CURTIS
 January 6, 1958